Amendment to the Claims:

Please cancel claims 3-19, 32-34, and 36 without prejudice or disclaimer and add new claims 37-62 listed below.

1. to 2. Previously cancelled.

3. to 19. Currently cancelled.

20. to 31. Previously cancelled.

32. to 34. Currently cancelled.

35. Previously cancelled.

36. Currently cancelled.

37. (New) A core/shell nanoparticle oligonucleotide conjugate comprising

(a) a metal-containing core;

(b) a non-alloying gold shell surrounding the core; and

(c) oligonucleotides attached to the gold shell, wherein the core of the core/shell nanoparticle does not exhibit a red shifting and broadening of the plasmon resonance band relative to a core surrounded by an alloyed gold shell.

38. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 37 wherein the oligonucleotides have a sequence complementary to a portion of a sequence of a target nucleic acid.

39. (New) The core/shell nanoparticle oligonucleotide conjugate of Claim 37 wherein the oligonucleotides include a moiety comprising a functional group which can bind to a nanoparticle.

40. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 37 wherein the metal-containing core comprises silver, Pt, Fe, Co, or Ni.

41. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 40 wherein the core comprises silver.

42. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 37 wherein the metal-containing core comprises an alloy metal comprising FePt or FeAu.

43. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 37 wherein the metal-containing core comprises a metal oxide.

44. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 37 wherein the metal-containing core is magnetic.

45. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 43 wherein the metal-containing core comprises Fe_3O_4 or Co_3O_4.

46. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 37 wherein the gold shell ranges from about 0.5 to about 2 monolayers in thickness.

47. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 37, wherein the non-alloying gold shell is generated on a surface of the core by simultaneous addition of a solution comprising a gold salt and a solution comprising a reducing agent to a solution containing the metal-containing core.

48. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 37 wherein the gold salt comprises $HAuCl_4$, $NaAuCl_4$, $KAuCl_4$, or $KAu(CN)_2$.

49. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 48 wherein the gold salt is $HAuCl_4$.

50. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 37 wherein the reducing agent comprises $NaBH_4$, ascorbic acid, NH_2OH or N_2H_4.

51. (New) The core/shell nanoparticle oligonucleotide conjugate of claim 50 wherein the reducing agent is $NaBH_4$.

52. (New) The core/shell nanoparticle oligonucleotide conjugate of Claim 37 wherein nanoparticle-oligonucleotide conjugates are produced which have the oligonucleotides present on surface of the nanoparticles at a surface density of at least 10 picomoles/cm^2.

53. (New) The core/shell nanoparticle oligonucleotide conjugate of Claim 52 wherein the oligonucleotides are present on surface of the nanoparticles at a surface density of at least 15 picomoles/cm^2.

54. (New) The core/shell nanoparticle oligonucleotide conjugate of Claim 53 wherein the oligonucleotides are present on surface of the nanoparticles at a surface density of from about 15 picomoles/cm^2 to about 40 picomoles/cm^2.

55. (New) A method for making core/shell nanoparticle conjugates comprising

(a) providing core/shell nanoparticles comprising metal-containing cores and non-alloying gold shells surrounding the cores, wherein the cores of the core/shell nanoparticle conjugates do not exhibit a red shifting and broadening of the plasmon resonance band relative to cores surrounded by alloyed gold shells;

(b) contacting the oligonucleotides with the core/shell nanoparticles in a first aqueous solution for a period of time sufficient to allow some of the oligonucleotides to bind to the nanoparticles;

(c) adding at least one salt to the aqueous solution to create a second aqueous solution; and

(d) contacting the oligonucleotides and nanoparticles in the second aqueous solution for an additional period of time to enable additional oligonucleotides to bind to the nanoparticles.

56. (New) The method of Claim 55 wherein the oligonucleotides include a moiety comprising a functional group which can bind to a nanoparticle.

57. (New) The method of Claim 55 wherein all of the salt is added to the water in a single addition.

58. (New) The method of Claim 55 wherein the salt is added gradually over time.

59. (New) The method of Claim 55 wherein the salt is selected from the group consisting of sodium chloride, magnesium chloride, potassium chloride, ammonium chloride, sodium acetate, ammonium acetate, a combination of two or more of these salts, one of these salts in a phosphate buffer, and a combination of two or more these salts in a phosphate buffer.

60. (New) The method of Claim 59 wherein the salt is sodium chloride in a phosphate buffer.

61. (New) The method of Claim 55 wherein nanoparticle-oligonucleotide conjugates are produced which have the oligonucleotides present on surface of the nanoparticles at a surface density of at least 10 picomoles/cm^2.

62. (New) The method of Claim 61 wherein the oligonucleotides are present on surface of the nanoparticles at a surface density of at least 15 picomoles/cm^2.

63. (New) The method of Claim 62 wherein the oligonucleotides are present on surface of the nanoparticles at a surface density of from about 15 picomoles/cm^2 to about 40 picomoles/cm^2.

64. (New) The method of Claim 55 wherein the core/shell nanoparticles are prepared by treating the metal-containing core simultaneously with a solution comprising a gold salt and a solution comprising a reducing agent under conditions that produce a non-alloying gold shell surrounding the nanoparticle cores.

65. (New)The method of claim 64 wherein the gold salt comprises $HAuCl_4$, $NaAuCl_4$, $KAuCl_4$, or $KAu(CN)_2$.

66. (New) The method of claim 65 wherein the gold salt is $HAuCl_4$.

67. (New) The method of claim 64 wherein the reducing agent comprises $NaBH_4$, ascorbic acid, NH_2OH or N_2H_4.

68. (New) The method of claim 67 wherein the reducing agent is $NaBH_4$.

69. (New) A method of detecting nucleic acid bound to a surface comprising:

(a) contacting the surface with a solution comprising core/shell nanoparticle oligonucleotide conjugates of claim 37, wherein the nanoparticle core is magnetic, and wherein the contacting takes place under conditions effective to allow hybridization of the core/shell nanoparticle oligonucleotide conjugates with the bound nucleic acid;

(b) subjecting the nanoparticle conjugate to an external magnetic field so as to accelerate movement of the nanoparticle conjugate to the surface to promote interaction between the nanoparticle conjugate and the nucleic acid;

(c) removing from the surface any nanoparticle conjugates that have not hybridized with the nucleic acid; and

(d) observing a detectable change brought about by hybridization of the nucleic acid with the nanoparticle conjugates.

70. (New) The method of claim 69 wherein the core/shell nanoparticle oligonucleotide conjugate comprises Fe_3O_4/gold core/shell nanoparticles.

71. (New) The method of claim 69 wherein step (c) is performed by rinsing the surface with a wash solution or reversing the magnetic field.

72. (New) A core/shell nanoparticle oligonucleotide conjugate made according to the method of claim 55.